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**APPELLANTS' AMENDED BRIEF & APPENDIX**

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on May 29, 1997

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	Docket No. 91221B
Thomas Joseph Segatta et al	)	Art Unit: 1301
For: TIRE WITH APEX	)	Examiner: Adrienne C Johnstone
RUBBER BLEND AND METHOD	)	<b>BEFORE THE BOARD OF PATENT</b>
OF MAKING THE SAME	)	<b>APPEALS AND INTERFERENCES</b>
Serial No. 08/353,942	)	
Filed: December 12, 1994	)	

Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

Dear Sir:

**AMENDED APPEAL BRIEF**

Appellants by virtue of their Notice of Appeal filed December 11, 1996, hereby file their Amended Brief in triplicate in response to the Notification of Non-compliance mailed May 20, 1997. Appellants have previously authorized a charge to their Deposit Account No. 07-1725 in the amount of \$300 to cover the fee for filing the Brief in support of this appeal. Any deficiency or overpayment related to this Amended Appeal Brief should be charged or credited to this Deposit Account.

**REAL PARTY IN INTEREST**

The Goodyear Tire & Rubber Company is the real party in interest by virtue of an assignment from all the designated inventors. The assignment was signed by such inventors on September 9, 1992. The assignment has not been recorded in the United States Patent & Trademark Office.

**RELATED APPEALS AND INTERFERENCE**

Appellants are not aware of any related appeals and interferences.

## **STATUS OF THE CLAIMS**

Claims 1, 2, 4, 5, 6 and 8-14 are rejected and are subject to this appeal. Claims 3 and 7 have been cancelled.

## **STATUS OF THE AMENDMENTS**

The amendment after final rejection under 37 CFR 1.116 that was filed November 7, 1996, has been entered upon the filing of the Notice of Appeal on December 11, 1996. In an Advisory Action mailed November 22, 1996, the Examiner further amended claim 1, line 7, changing "2" to -about 12--.

## **SUMMARY OF THE INVENTION**

This invention relates to a pneumatic tire having an apex in the region of the steel cord reinforced carcass ply turnup (page 1, lines 1-3, and Reference Number 16 in Figure 1). The term "apex" as used herein refers to the area of the tire in the immediate proximity of the carcass ply turnup. The apex includes a rubber wedge (16) located in the lower sidewall region above the bead (18) and is bonded to and encased by the carcass plies (12).

The apex (16) also includes the area located between the lower sidewall rubber and the axially outer side of the carcass ply turnup (page 1, lines 15-18).

The pneumatic tire of the present invention is characterized by the composition used in the apex. The apex is comprised of, based upon 100 parts by weight of rubber, (A) about 80 to about 97 parts by weight of at least one diene rubber selected from the group consisting of natural rubber, synthetic cis 1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber; and (B) about 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber having about 75 to about 85 percent by weight trans 1,4-content, about 2 to about 18 percent by weight of a vinyl 1,2-content and about 3 to about 8 percent by weight of a cis 1,4-content and, in its uncured state, a first major melting point in the range of about 35°C to about 45°C and a second minor melting point in the range of about 55°C to about 65°C (page 3, lines 31, through page 4, line 7; page 5, line 3, through page 5, line 14).

The present invention also includes a method of making the above-referenced pneumatic tire (page 4, lines 8-23).

### **ISSUES BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

The first issue before the Board of Patent Appeals and Interferences is whether claims 1-2, 4-6 and 8-14 have properly been rejected under 35 U.S.C. § 103 as being obvious over U.S. Patent 5,174,838 issued to Sandstrom et al (Sandstrom '838), in view of European Patent Application 0410311 or alternatively in view of European Patent Application 0461329 or Japanese Patent Application 1-135847.

The second issue before the Board of Patent Appeals and Interferences is whether claims 1-2, 4-6 and 8-14 have properly been rejected under 35 U.S.C. § 103 as being obvious over U.S. Patent 4,824,899 issued to Yasuda in view of Sandstrom '838.

The third issue is whether claims 1-2, 4-6 and 8-14 have properly been rejected under 35 U.S.C. § 103 as being obvious over Japanese Patent Application 57-212239 in view of Sandstrom '838.

### **GROUPING OF CLAIMS**

All claims under each of the three issues will stand or fall together as to each issue.

### **ARGUMENT**

#### First Issue Before the Board of Patent Appeals and Interferences

Accompanying this Brief is the second declaration of Paul Sandstrom, a designated inventor in the present application and a designated inventor of Sandstrom '838 (one of the cited references). His declaration will be periodically referred to by the respective passages. A copy of this Declaration appears in the Appendix to this Brief.

Let's review the facts, accompanying an earlier response filed in the parent application (Serial No. 07/945,465 filed September 16, 1992) was the signed declaration of Paul Harry Sandstrom. This is the declaration in the Appendix to this Brief. As stated in Mr Sandstrom's second declaration, he is the same Paul Sandstrom appearing as a named inventor on the primary reference (Sandstrom '838). The rubber compound used in the tread base in Sandstrom '838 is comprised of at least one diene rubber and a high trans 1,4-polybutadiene rubber. The tread cap rubber compound is formulated to provide good skid resistance, tread wear and rolling resistance. The tread base rubber compound is formulated to enhance rolling resistance and durability of the tire. The primary purpose for dividing a tread into an outer cap portion and an underlying base portion is to provide a tread base which will reduce the tire's overall rolling resistance. As taught in Sandstrom '838 (Column 1, lines 35-42), the cap/base rubber composite may be designed to improve the rolling resistance of the tire without unduly sacrificing its traction or tread wear. However, such a desirable aspect is difficult to obtain with a single tread compound because, for example, rolling resistance reduction is typically obtained at the expense of traction and/or tread wear. Therefore, this reference clearly teaches using a different rubber compound in the tread cap and in the tread base.

It has been recognized by the Examiner that Sandstrom '838 does not teach the rubber composition containing trans 1,4-polybutadiene should be used in the apex region. However, the Examiner has relied on the secondary references cited above as disclosing use of rubber compositions suitable for the bead and/or apex region of the tire as well as the tread. The stated conclusion of the Examiner's Action is that it would have been obvious of one of ordinary skill in the art at the time of the invention to use the composition of Sandstrom '838 in the bead area since it is known that compositions disclosed for use in the tread area of the tire are suitable for use in the tire apex. This contention is respectfully traversed.

Mr Sandstrom comments on the teachings of the Abstract to EP 410311 in his second declaration at paragraph 4. This abstract teaches the use of a rubber compound of which 30 to 100 percent of the rubber consists of a hydrocarbon rubber containing nitrile groups. The Abstract discloses that the specific rubber compound may be used in at least the tread, sidewall, profile core and bead. The profiled core (7) is the apex of the tire. The Abstract goes on to teach that the bead and/or outer cores are preferably free from phenolic resin. This implies to Mr. Sandstrom that phenolic resins may be used in the tread and, therefore, the rubber compound from the tread is not identical to the rubber compound used in the apex aside from the common usage of the 30 percent to 100 percent of the hydrocarbon containing nitrile groups. Appellants' claims exclude a hydrocarbon rubber containing nitrile groups. Simply because one reference says a particular rubber compound may be used in an apex of a tire and in a tread does not mean that all compounds for use in a tread are acceptable for use in an apex of a tire. Not all compounds for use in a tread are equivalent. In addition, there is no teaching in this reference that hydrocarbon rubber containing nitrile groups may be a replacement for any of the rubbers disclosed in Sandstrom '838 including trans 1,4-polybutadiene rubber. Another point of interest is that Sandstrom '838 teaches the importance of a two-component tread (base and cap) coupled with the trans-polybutadiene in the base (nonground contacting). The abstract for EP 410311 does not make such a distinction and, therefore, would imply the use of the rubber with nitrile groups in the cap compound (ground contacting) since not all tires have two component treads. The wrongful assumption on the part of the Examiner is EP 410311 suggests the equivalence of a tread base compound and a compound for use in an apex.

During Mr. Sandstrom's 30 years of experience in the field of polymer science, he has learned that there are hundreds of recipes for rubber compounds, each of which are typically tailored to their end use in a tire. The pneumatic tire is a complex system of interacting components, each with its own properties for maximum effectiveness; yet, the performance of the tire depends on the interactions of the components. The reason for this is because each component of the tire has its own performance requirements which must be considered when formulating the rubber compound for use in the respective component. For example, when one is formulating a rubber compound for use in a tread cap, one looks for properties that include high elongation and high tear strength so the tire tread has higher rolling resistance and maximum cut growth resistance. When one is formulating a rubber compound for use in an apex, one looks for properties that include high stiffness and high modulus because the tire designer does not want the apex area to move to avoid delamination of the tire from the rim during use. Rubber compounds with high stiffness and high modulus would necessarily have low tear strength and low elongation values. Rubber compounds for tread caps would have high tear and high elongation values. Therefore, the desired properties for an apex and a tread cap are not consistent.

The other secondary reference that is cited in the Examiner's Action is EP 461329. EP 461329 discloses the use of reinforced polymer blends containing micro and macrofibers in various tire components. The polymer blends are described as being useful in the tread base, tread, apex, sidewall and bead areas of tires. The reinforced polymer blends contain a base polymer, such as polyisoprene, SBR, polybutadiene, NBR, polychloroprene, natural rubber and EPDM. To this base polymer, one mixes a macro fiber of a polyamide, polyester, polyolefin, cellulosic fiber, polyamide, polyurea, polyurethane and polybenzamide azote. Examples of micro fibers include polyamide, polyesters, polyurethanes and mixtures thereof. Trans polybutadiene is not taught. More specifically, this reference does not disclose or suggest the use of an apex composition comprised of, based on 100 parts by weight of rubber, (a) about 80 to 97 parts by weight of at least one rubber selected from the group consisting natural rubber, synthetic cis-1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber and (b) 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber having from 75 to about 85 percent by weight trans



1,4-content. The claimed invention in the present application is not the first pneumatic tire with an apex compound. Hundreds of compounds have been tested for use in an apex. However, two essential points need to be made. First, a specific tread base compound is not viewed by one skilled in the art as a drop in the slot replacement for an apex compound. At best, the prior shows certain inventions (operating within their ranges) may be adjusted for different applications. Second, the reinforced compounds of EP 461329 are not taught as being equivalent nor are they in the mind of Mr Sandstrom, to the compounds used in Sandstrom '838.

The Abstract to Japanese publication 1,135,847 has also been cited by the Examiner to supplement the noted deficiencies of Sandstrom '838. This abstract discloses a tire containing a butadiene polymer having 70 to 90 percent of trans 1,4-bonds. The polymer may be used for tread, sidewall, belt and bead applications. This abstract does not disclose the specific limitations found in Appellants' claims directed to the use of trans 1,4-polybutadiene in an apex wherein the uncured state of the polybutadiene has two melting points. The abstract also does not suggest that a tread compound may be substituted for an apex compound. As stated above, simply because a given rubber compound may have a utility in two or more components of a tire does not mean such compound has a utility in all components of a tire.

#### Second Issue Before the Board of Patent Appeals and Interferences

Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. as being unpatentable over U.S. Patent 4,824,899 issued to Yasuda in view of U.S. Patent 5,174,838 issued to Sandstrom et al. This rejection is respectfully traversed.

U.S. Patent 4,824,899 issued to Yasuda teaches the use of 1 to 15 parts by weight of a metal salt of acrylic acid. The present invention requires from about 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber. Yasuda does not suggest or disclose nor is Mr. Sandstrom aware of any reference that would suggest or disclose that trans 1,4-polybutadiene is equivalent to or is a known replacement for a metal salt of acrylic acid in a rubber for use in any tire. It is contended that the combination in Yasuda results in a composition substantially similar in properties to the composition of Sandstrom et al. This is not shown in the reference and Appellants respectfully repeat their prior request for a declaration or affidavit from the Examiner to support the Examiner's position that the compositions of Yasuda are substantially similar to those of Sandstrom '838. Simply because one combines a rubber with a certain additive to improve a certain property does not necessarily demonstrate that the resulting compositions have the same properties overall. While it is a given that certain components of a tire require specific minimum properties to function, it is wrong to believe that merely reproducing such properties of different prior art compounds anticipates or renders obvious all future compounds with the same properties. Appellants are not claiming properties but rather a pneumatic tire with a specific apex.

The patentable differences cited above in connection with Sandstrom '838 will not be repeated herein; however, those noted differences in Sandstrom '838 have not been supplemented in any way Yasuda.

### Third Issue Before the Board of Patent Appeals and Interferences

Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. §103 as being unpatentable over the Abstract for Japanese publication 57-212239 in view of Sandstrom '838. This rejection is respectfully traversed. The Abstract to the Japanese publication teaches a rubber composition for a bead filler which is comprised of (a) 100 parts by weight of rubber composed of (1) 70 to 95 parts of a solid rubber selected from natural rubber, polyisoprene rubber, polybutadiene rubber and styrene-butadiene rubber and (2) 30 to 5 parts of a liquid diene rubber having functional groups at the molecular terminals or in the molecule with (B) a masked polyisocyanate and (D) 5 to 25 parts by weight of a novolac-type phenolic resin and/or a novolac-type modified phenolic resin. The Examiner has cited page 2, lower left hand of the text, lines 11-20 as teaching the use of polybutadiene. Once again, Appellants have not been provided with a translation of this reference other than the English translation of the Abstract. Appellants would appreciate if such a copy would be provided since the Examiner continues to maintain the rejection of claims based upon passages of this reference other than those English passages found in the Abstract. Is the Examiner suggesting the cited passage is more relevant than the Abstract?

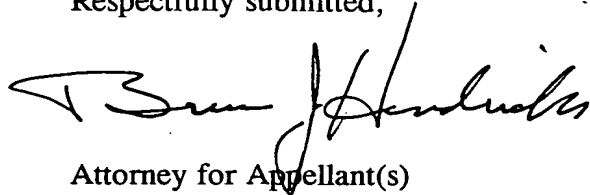
The teaching of a diene type rubber such as polybutadiene is generally meant to include cis 1,4-polybutadiene rubber. Cis 1,4-polybutadiene rubber and trans 1,4-polybutadiene are drastically different rubbers. The above distinction is further reinforced by the limitations found in claims 1 and 5 which not only specify the relative weight percentages of trans 1,4-content, vinyl 1,2-content and cis 1,4-content, as well as the two melting points. This reference also fails to suggest or disclose that the liquid diene rubber having functional groups at the molecular terminals or in the molecule coupled with the use of a masked polyisocyanate is equivalent to or may be a drop in slot replacement for trans 1,4-polybutadiene. It is stated in the Examiner's Action that Sandstrom et al teach that trans 1,4-polybutadiene is well known for improving green strength of rubber mixtures and, thus, would be well suited for use in the bead filler of the Japanese publication. Is such a suggestion in the mind of the Examiner or founded in the cited art. Appellants submit the latter is not the case at hand. Appellant's review of the Abstract indicates nothing is said about improving green strength. It is only the Examiner's opinion that suggests the

combination and not the references themselves. It was stated in the Examiner's Action that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the trans 1,4-polybutadiene of Sandstrom '838 as the liquid diene rubber required by the Japanese publication 57-212239. Once again, Appellants respectfully request where such equivalence is taught in the references. Appellants contend that such a showing is not taught, disclosed or would be suggested to one of ordinary skill in the art. Trans 1,4-polybutadiene is not liquid at room temperature as is apparent by its reacted melting points. It is also stated in the Examiner's Action that such a combination of references results in a composition essentially similar to that of Appellants. Once again, the Examiner has simply looked at one property that is allegedly improved and concluded that all of the properties would be similar. This conclusion is not supported in the cited references standing alone or in combination.

As the CAFC has said "to imbue one of ordinary skill in the art with knowledge of the invention in suit when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teaching." W L Gore, 721 F2d at 1553 220 USPQ at 312-13. One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. In re Fine at 1600. Based upon the foregoing, Appellants respectfully submit that the case of prima facie obviousness has not been shown and, therefore, the PTO has failed to meet its burden with respect to the required by law for showing of obviousness under 35 U.S.C. §103.

Based upon the foregoing, Appellants respectfully request reversal of the rejection of the pending claims and earnestly solicit a Notice of Allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Bruce J. Hendricks". The signature is written in a cursive, flowing style with a large initial "B".

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## APPENDIX

1. A radial tire comprising a steel cord reinforced carcass ply and an apex of a composition comprised of, based on 100 parts by weight rubber, (A) about 80 to about 97 parts by weight of at least one diene rubber selected from the group consisting of natural rubber, synthetic cis 1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber; and (B) about 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber having about 75 to about 85 percent by weight trans 1,4-content, about 12 to about 18 percent by weight of vinyl 1,2-content and about 3 to about 8 percent by weight cis 1,4-content and, in its uncured state, a first major melting point in the range of about 35°C to about 45°C and a second minor melting point in the range of about 55°C to about 65°C.

2. The tire of claim 1 wherein said apex composition is comprised of, based on 100 parts by weight rubber, (A) about 90 to about 95 parts by weight of at least one of said diene rubbers, and (B) about 5 to about 10 parts by weight of said trans 1,4-polybutadiene rubber.

4. The tire of claim 1 wherein said at least one diene rubber is natural rubber.

5. A method of preparing a pneumatic rubber tire having a steel cord reinforced carcass ply and an apex which comprises shaping and curing an uncured pneumatic rubber tire in a mold by pressing said tire outwardly against a mold surface under conditions of heat and pressure to cause at least the tread rubber of said tire to flow and cure against said mold surface, the improvement comprising the use of a rubber composition in the apex comprised of, based on 100 parts by weight rubber, (A) about 80 to about 97 parts by weight of at least one diene rubber selected from the group consisting of natural rubber, synthetic cis 1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber; and (B) about 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber having about 75 to about 85 percent by weight trans 1,4-content, about 12 to about 18 percent by weight of vinyl 1,2-content and about 3 to about 8 percent by weight cis 1,4-content and, in its uncured state, a first major melting point in the range of about 35°C to about 45°C and a second minor melting point in the range of about 55°C to about 65°C.

6. The method of claim 5 wherein said apex rubber composition is comprised of, based on 100 parts by weight rubber, (A) about 90 to about 95 parts by weight of at least one of said diene rubbers, and (B) about 5 to about 10 parts by weight of said trans 1,4-polybutadiene rubber.

8. The method of claim 5 wherein said at least one diene rubber is natural rubber.

9. The tire of claim 1 wherein said trans 1,4-polybutadiene has a trans 1,4-content of about 80 percent by weight, a cis 1,4-content of about 5 percent by weight and a vinyl 1,2-content of about 15 percent by weight.

10. The tire of claim 1 wherein said trans 1,4-polybutadiene has a number average molecular weight (Mn) of about 205,000.

11. The tire of claim 1 wherein said trans 1,4-polybutadiene has a weight average molecular weight (Mw) of about 403,000.

12. The method of claim 5 wherein said trans 1,4-polybutadiene has a trans 1,4-content of about 80 percent by weight, a cis 1,4-content of about 5 percent by weight and a vinyl 1,2-content of about 15 percent by weight.

13. The method of claim 5 wherein said trans 1,4-polybutadiene has a number average molecular weight (Mn) of about 205,000.



14. The method of claim 5 wherein said trans 1,4-polybutadiene has a weight average molecular weight (Mw) of about 403,000.